OPERATION & SERVICE MANUAL 65-11-7

BEL 505 / BEL 505S

SEMI-AUTOMATIC CASE FORMER AND PACKING STATION

Wexxar Packaging Inc. a division of Pro Mach
Phone (604) 270-0811 • Fax (604) 270-7897
E-mail: sales@wexxar.com

SAFETY CAUTION

Although the BEL 505 & 505 'S' packing stations can be used in conjunction with competitive case taper/sealers, BELCOR cannot assume responsibility for safety issues resulting from these applications**. We specifically do not recommend using these packing stations in close proximity with conventional back flap "kickers" and three-flap folders.**

Be sure that:

- the main on/off valve at the air connection is shut off and that the red emergency stop button is pushed down before connecting an air supply to the machine.
- the machine is disconnected from the air source before undertaking any maintenance or service procedures. This is to avoid inadvertent machine actuation that could result in personal injury.

Never leave the machine unattended with the air switch on.

Only qualified personnel must operate the machine!

BEL 505

SEMI-AUTOMATIC CASE FORMER AND PACKING STATION

Standard Case Size Range:

	Length	Width	Height
Minimum	8” (203mm)	6” (152mm)	3.5” (89mm)
Maximum	26.5” (673mm)	16” (406)	Unlimited
Machine Size	37.5 (953mm)	25 (635mm)	18.5” (470mm) [min]

Case Infeed/Outfeed Height:

- **UHMW Pads:** 21.5” (546mm) [min] 28.5” (724mm) [max]
- **Castors:** 25” (635mm) [min] 32” (813mm) [max]

Power Requirements (standard):

- **Compressed Air:** 80-90 PSI ; 0.1 CF/Cycle

BEL 505 ‘S’

SEMI-AUTOMATIC CASE FORMER AND PACKING STATION

Standard Case Size Range

	Length	Width	Height
Minimum	8” (203mm)	5” (127mm)	3.5” (89mm)
Maximum	16” (406mm)	15” (381mm)	Unlimited
Machine Size	27.5” (700mm)	25” (635mm)	22 (560)

Case Infeed/Outfeed Height:

- **UHMW Pads:** 21.5” (546mm) 28.5” (724mm)
- **Castors:** 25” (635mm) 32” (813mm)

Power Requirements (standard):

- **Compressed Air:** 80-90 PSI ; 0.1 CF/Cycle

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INTRODUCTION

The BEL 505 & 505 'S' are designed for semi-automatic folding of new corrugated cases. The machines combine the following functions:

1. A bottom major and minor flap folder mechanism assist in erecting flat cartons ready for packing.
2. A packing station position to fill the case with product.

The machine does not require a high level of technical knowledge to operate.

ABOUT THIS MANUAL

The *Installation* section in the beginning of the manual is intended for those who will be installing and maintaining the machine.

The *Machine Set-up* and *Machine Operation* instructions should provide a new operator with the knowledge needed to run the machine safely and effectively. **No one should operate the machine without first reading this manual.**

Following the operating instructions is a *Troubleshooting* section to provide solutions to common problems that may occur with the quality of corrugated cartons used and effectiveness of the case folding process.

A separate "Technical Reference" manual or manual section provides details on parts kits, parts identification and machine construction for those who will service and repair the machine.

PLEASE NOTE:

Best performance with BEL machines will occur when adjusted, operated and maintained in accordance with the instructions in this manual. We cannot be responsible for unauthorized changes to the machine or methods of its operation.

The following information is a reference guide for our standard machines. We strive to provide up-to-date manuals with machines but we are continually improving our products and the details in the manual provided might not exactly match the machine at the time it is shipped. Many machines are modified in response to customer requests or as required by the case samples supplied at the time the machine is built and the manual may not provide a complete reference to the changes or modifications. If there are any questions about your machine not covered by the manual, please contact us and we will do our best to provide the additional information you need.

INSTALLATION PROCEDURES

INSTALLING THE BEL 505 & 505 'S'

Unpack the machine and remove any packing material from the interior or supports from underneath used to protect components during shipping.

Install the legs at each of the three positions on the machine frame with one nut and washer for each leg underneath the frame and another nut and washer on the inside. If the 505 or 505S is to be mounted on [and supported from] the case sealer with mounting options 70-378 or 70-395, refer to the instructions included with them.

LEVELLING THE MACHINE

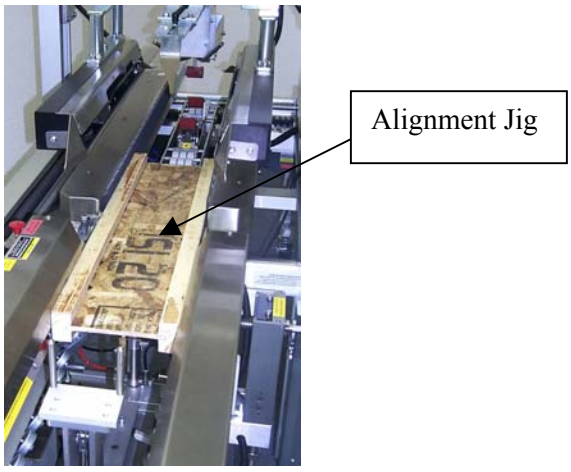
If standing directly on the floor, the base of the frame should be made level to ensure personnel safety, provide optimum performance and avoid frame stress.

Please note that the standard BEL 505 & 505 'S' are intended to operate in a horizontal position. Attempting to tilt the 505 or 505 'S' toward the operator will cause excessive wear in the case width adjustment mechanism and may case it to bind or damage the width adjustment screw. A width adjustment equalizer option 70-380 is on BEL 505's that are used with side-tilt mounted systems.

[Another possibility for a side-tilt system is the BEL Model 507 Tilt Packing Station. It is designed to tilt towards the operator for case erecting and loading and then back to the horizontal position for feeding into a sealer or onto a conveyor.]

ALIGNING THE MACHINE

The machine should be securely mounted to adjoining equipment to prevent the machine moving as it operates. If being directly connected to a BEL case sealer, it is important that the centers of both machines be in line for ease of case transfer between machines. When a BEL 505 is provided together with a BEL sealer a jig is provided to further assist aligning the machines. The BEL 505 should be level with, or slightly higher than, the case sealer conveyor.



AIR CONNECTION

SAFETY CAUTION

Make sure that the red emergency stop button is pushed down (off) before connecting an air supply to the machine.

The air may come from either a separate source or by tapping off the supply of an adjoining case sealer. The supply must be clean factory air and must be lubricated by the unit on the machine.

Air pressure should be set to 80 psi. for most applications with a minimum setting of 65 psi. and maximum of 100 psi.

OPERATION & ADJUSTMENT PROCEDURES

SAFETY CAUTION

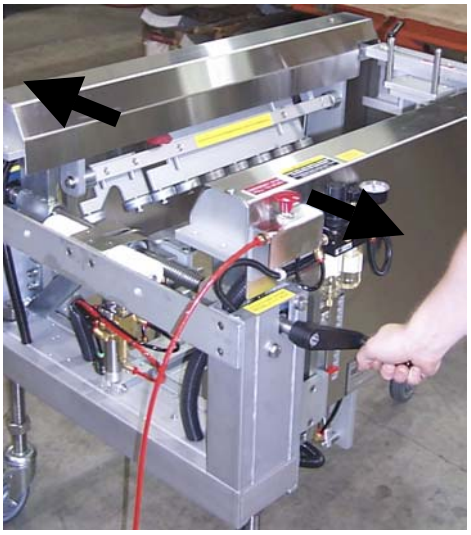
Switch off or disconnect the air supply to the machine before making any changes or adjustments.

MACHINE SET-UP ADJUSTMENTS

Setting up the BEL 505 & 505 'S' to fold a particular box size is accomplished with two main adjustments for case width and length. There is a third adjustment to reposition the major flap folder plates that, after initial setup, will need to be changed only where there is a large difference between cases widths.

CASE WIDTH

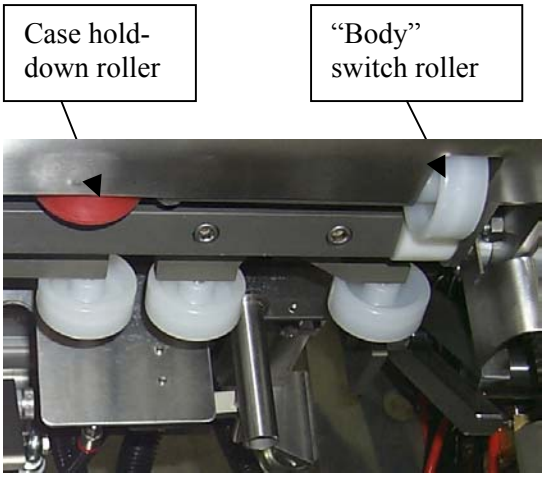
1. Loosen the hand knobs at the end of the BEL 505 or 505 'S'.



2. Attach the hand crank supplied with the machine on the square shaft that extends from either side of the frame. Adjust the frame to be wider than the case.

3. Open a case from the flat blank and insert it into the machine.

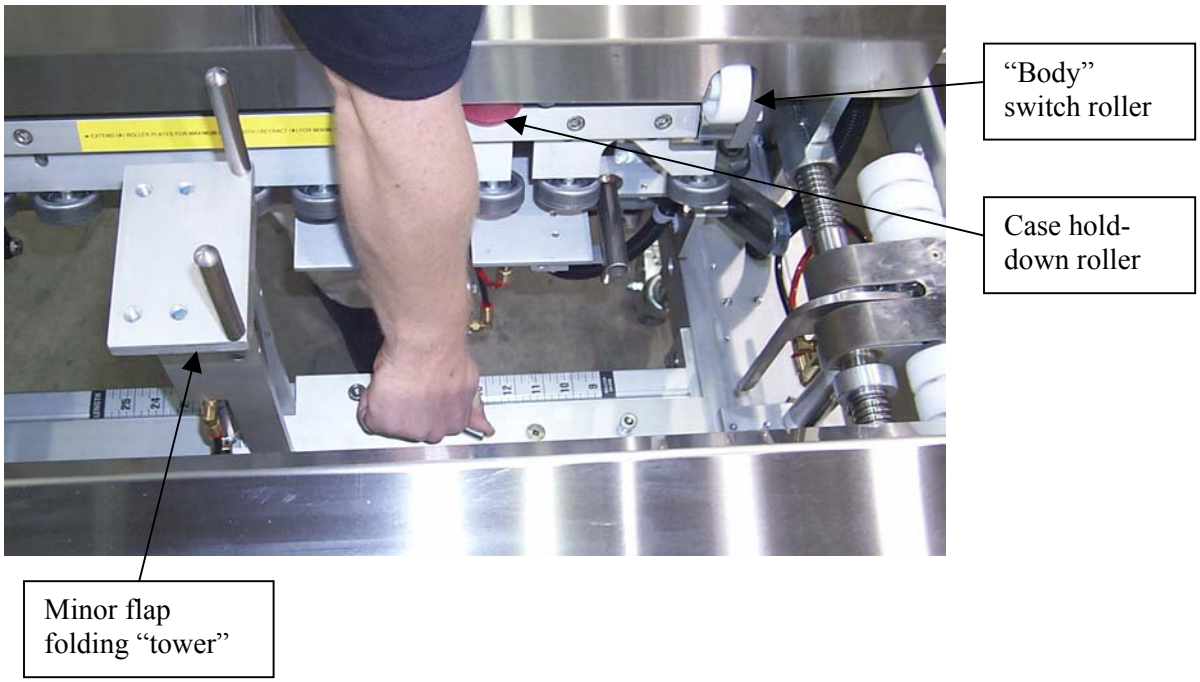
4. Crank in the width adjustment until the red case hold-down rollers are lightly gripping the sides of the case. It should be easy to insert and remove the case without forcing but it must maintain contact on the white "body " switch roller until the case leaves the machine.



5. Re-tighten the hand knobs.

CASE LENGTH

1. Remove the case and loosen the clamp at the base of the front minor flap folding "tower "



2. Reinsert the case into the machine and position it ½" back from the minor flap folder at the exit end of the machine. Push the tower forwards until it just contacts the back of the case. Remove the case and tighten the tower clamp

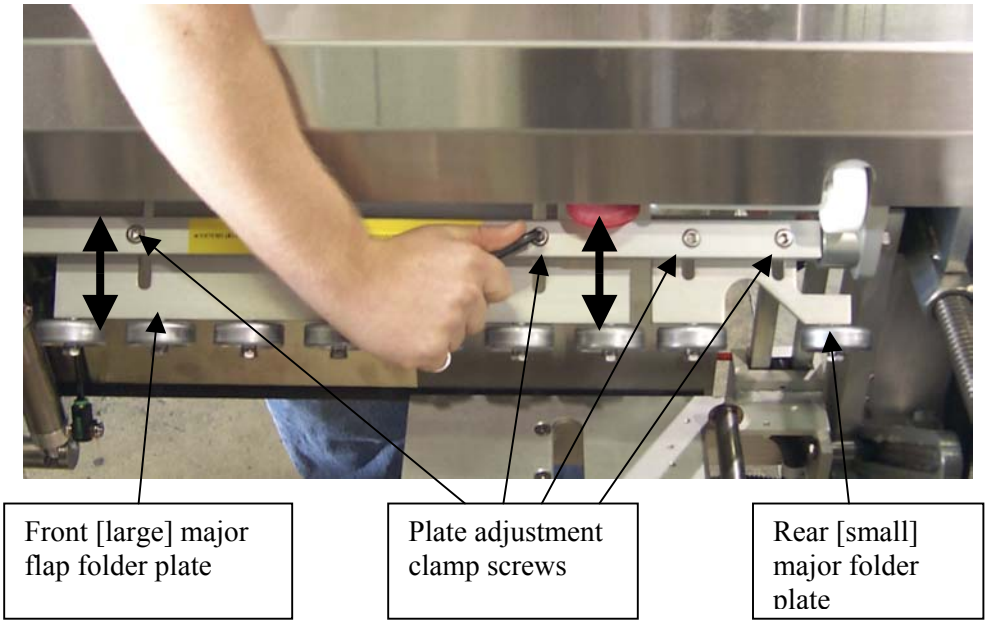
MAJOR FLAP FOLDER ROLLER PLATES

The major flap folding plates and wheels may need to be extended to provide additional support for wide heavy cases or retracted for narrow ones.

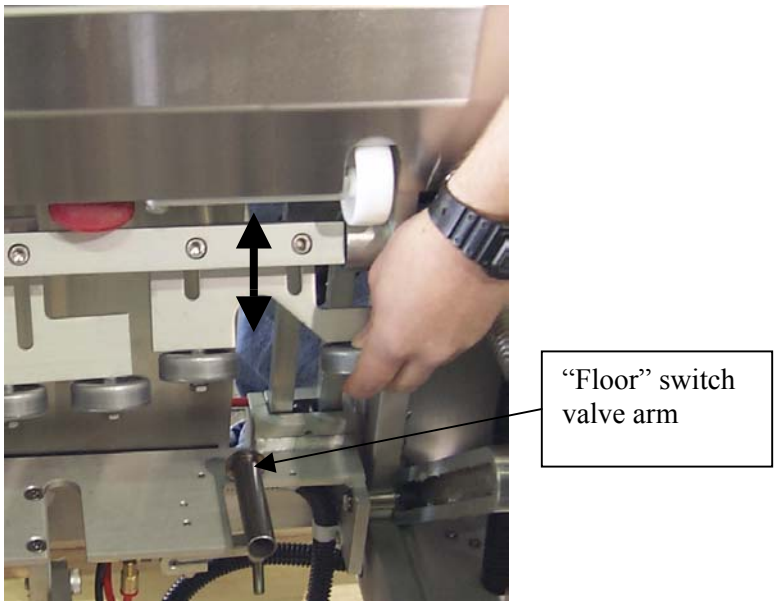
Important Note Regarding Major Folder Plates Adjustment: Sliding the plates in towards the machine centre increases the case bottom support but limits the minimum width adjustment when the major flap folder wheels hit the minor folder tower. Also, extended folder plates in the down position will wedge against the bottom control valve / flap opener bracket as the machine is adjusted for minimum width. If forced, either of these conditions can damage machine components.

There are two major folder plates on each side of the machine, one small and one large that are adjusted independently.

1. Loosen the four socket-head cap screws on each side that hold the folder rollers in place. Slide the front [large] folder to the desired position and retighten the screws.



2. Adjust the rear [small] major folder plate. Make sure that the plate will not contact the "floor" switch valve arm as it moves through its arc. For wide cases, the small folder plate will not be able to be extended as far as the large plate and has a separate adjustment for this reason.



Additional Note: For wide cases on 18" & 20" maximum width 505 versions, optional roller wheels are mounted on extensions from the folding plates to place them closer to the centre of the box for better folding performance and product support. Extensions may need to be removed for narrow cases run on the same machine to avoid interference with other machine components. If your application requires these extensions and they are not provided with your machine, contact BELCOR for information and parts.

MACHINE OPERATION

SAFETY CAUTION

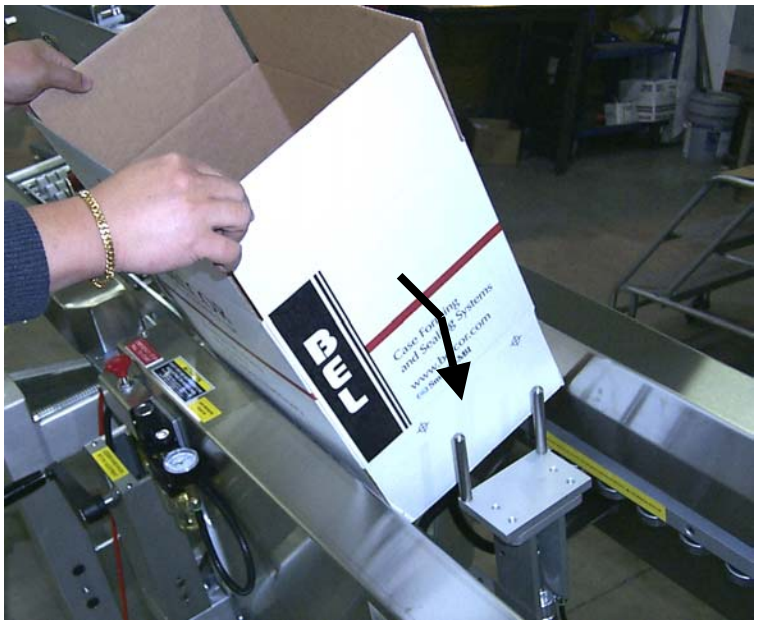
Make sure that the main on/off valve at the air connection is shut off and that the red emergency stop button is pushed down before connecting an air supply to the machine.

STARTING THE MACHINE

Prior to starting, hand swing all moving parts to check adjustment and for any mechanical interference. Turn on main supply valve, keeping hands clear of moving parts.

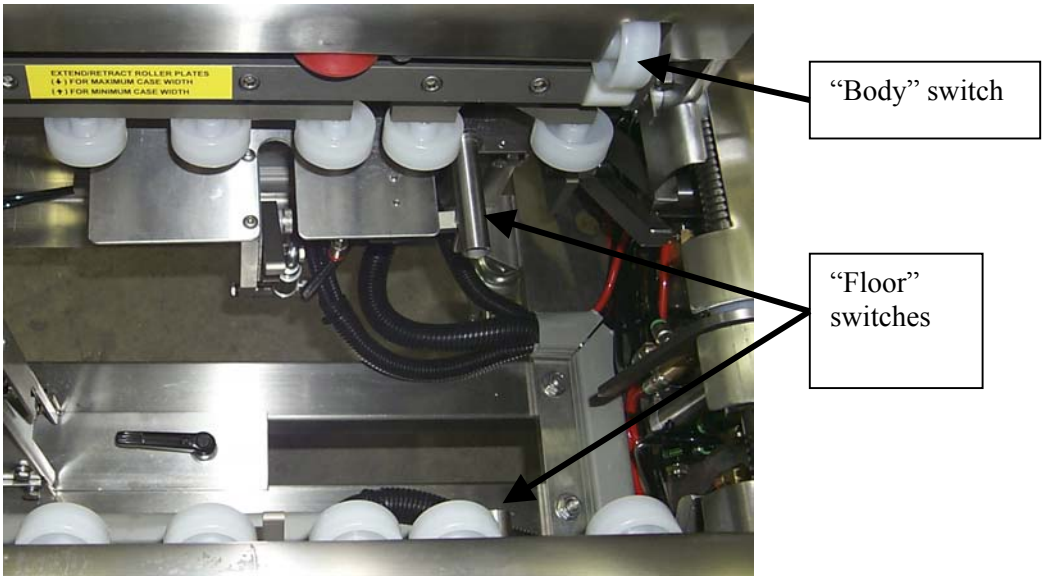
ERECTING A CASE

1. Open a case so that it is fairly square.
2. Place the open bottom into the BEL 505 or 505 'S', pushing the case all the way down to the floor switches
3. The machine will first fold the front and rear end minor flaps, then the two side major flaps. The case is held in place and is ready to fill, if desired
4. When filled, or if the case is just erected for filling downstream, push it out of the packing station to the next operation.
5. As the end of the case breaks contact with the "body" switch, the 505 will automatically reset ready for the next case.

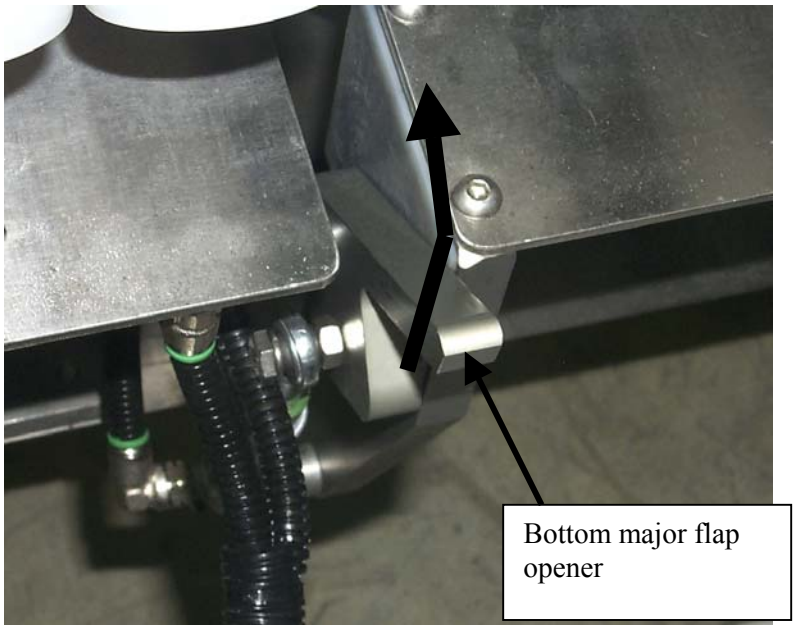


MACHINE OPERATING CYCLE

1. The bottom edges of the major flaps depress the actuators of the two "floor" switch valves and the side of the case depresses the wheeled "body" switch valve. All three switches must be actuated for the machine cycle to start.

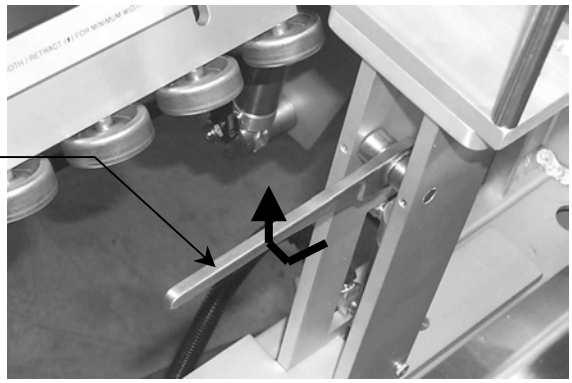


2. The two small levers of the major (side) flap openers momentarily open the bottom major flaps wider to clear the minor (end) flaps.



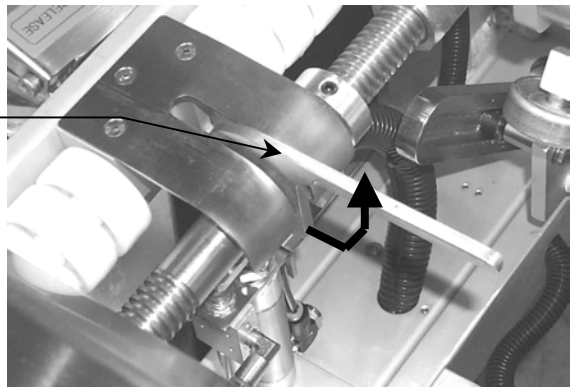
3. The minor flap folders fold up both end flaps of the box bottom and retract.

Front [tower] Minor Flap Folder



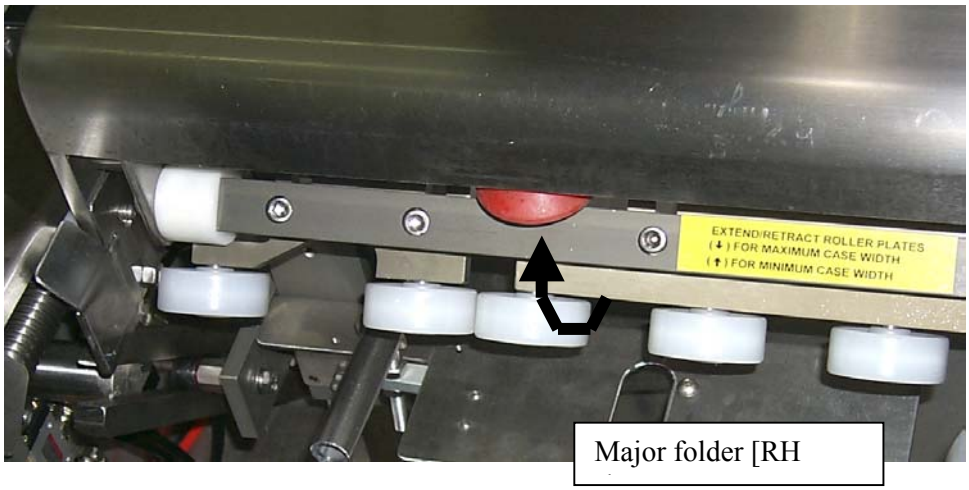
Front Minor Flap Folder

Rear Minor Flap Folder [Machine out-feed end]



Rear Minor Flap Folder

4. The major flap folders then fold up both side flaps of the bottom and stay in position to support the box for packing.



Major folder [RH

5. Pushing the box out of the machine breaks contact with the body switch inside the packing station. The machine then resets, ready for the next case.

TROUBLESHOOTING GUIDE

Problem: ***Case releases, all flaps drop, during folding or packing cycle.***

- Check that width adjustment is correct. If it is too wide, the wheeled "body switch" that contacts the side of the case will reset and cause the machine to return to the start position.
- Shaking the box to level the contents can cause the body switch to reset.
- Check that the body switch is correctly adjusted and secured in the frame for proper box contact and that the contact wheel is firmly attached.

Problem: ***Minor flaps fail to fold fully and return to home position, then may try to fold again.***

- Check that the actuator arms attached to the floor switches (mounted on floor plates) are not out of position or loose. Both of them should be in a position to be pushed down fully by the bottom flaps of the open box.

Problem: ***Major flaps have difficulty folding and cause inner edges of minor flaps to be folded over.***

- Check that the air pressure is adequate and that the air pressure does not drop during the cycle.
- Check that the flow controls on the small major flap opening cylinders are set so that they will momentarily open the major flaps wider and allow the minor flaps to clear the inside of the major flaps before releasing.

Problem: ***Back or front case collapses inward during minor flap folding.***

- Be sure that the case width setting does not hold the box too tightly.
- Check the air pressure and volume.
- Check that the scoring on the box is adequate and promotes folding.
- Check that the flow controls on the minor flap folding cylinders are set for a fast enough speed of the minor flap folders. Excessive speed, however, can cause damage of the folder arms.

Problem: ***Packed case fails to transfer smoothly from packing station into case sealer.***

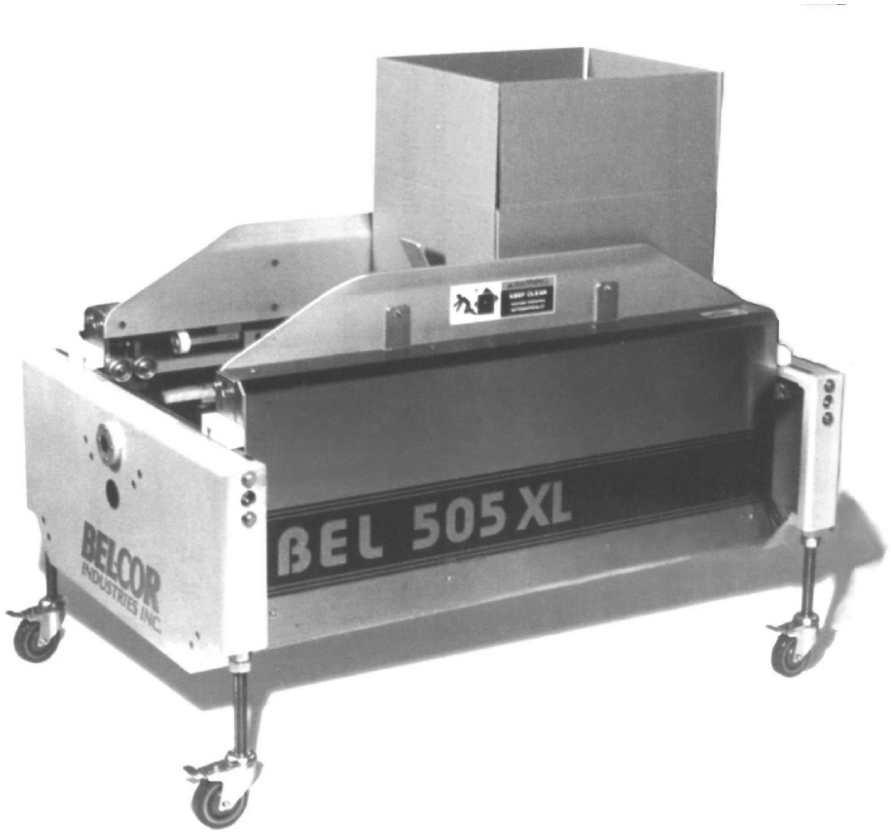
- Check the height of the rollers at the outfeed end of the packing station and that the box clears the machine frame.
- Check that the machines are aligned accurately, i.e. that the belt surfaces line up with the insides of the packing station when in the vertical position. Use a long straight-edge to check the alignment.

OPERATION & SERVICE MANUAL

65-13-4 Effective May 11, 2007
Replaces 65-13-3; April 11, 2007

BEL 505XL

LARGE CASE ERECTOR & PACK STATION



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SAFETY CAUTION

Although the BEL 505XL packing stations can be used in conjunction with competitive case taper/sealers, BELCOR cannot assume responsibility for safety issues resulting from these applications.

We specifically do not recommend using these packing stations in close proximity with conventional back-flap kickers and three-flap folders.

Depress the stop button and be sure all personnel are clear of the machine before connecting to an air supply.

Disconnect the machine from the air source before undertaking any maintenance or service procedures. This is to avoid inadvertent machine actuation, which could result in personal injury.

Never leave the machine unattended with the air switch on.

Machine must be operated by qualified personnel only!

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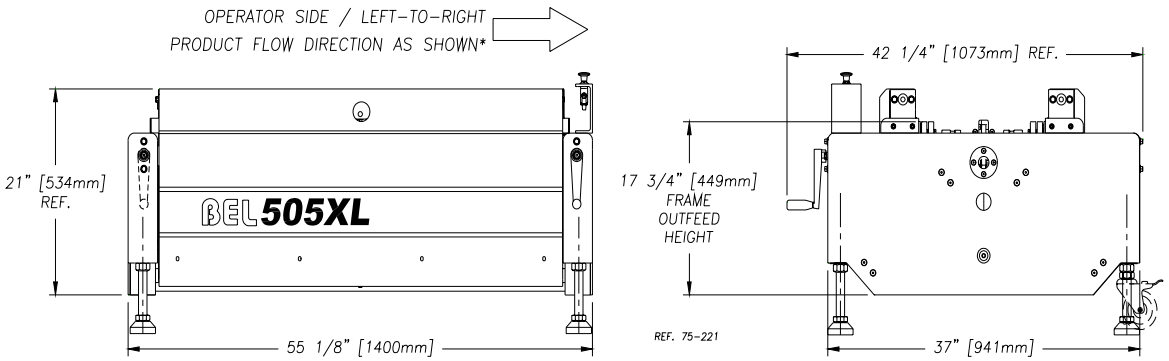
BEL 505XL

Semi-Automatic Large Case Former/ Packing Station

The BEL 505XL is a version of the BEL 505 series designed to handle case sizes up to 39" long and 24" wide [990mm x 610mm]. It folds the bottom flaps of large RSC case blanks opened and presented down into it by an operator and then firmly holds the case ready for packing. As the filled [or empty] case is pushed out of the 505XL into an adjacent case sealer, it resets itself automatically ready to receive the next case blank. The BEL 505XL is entirely pneumatically operated and requires only compressed air at 80-90 psi. / 6 Bar. Operator side or product flow direction needs to be specified at the time of a machine order in order to have all machine adjustments and controls accessible to the operator.



		Length	Width	Height
Case Size Range	Minimum	10" / 254mm	10" [8.3"*] / 254mm [210mm*]	3" / 76mm
	Maximum	39" / 990mm	24" / 610mm	-
Machine Dimensions		55.13" / 1400mm	37" / 940mm	21" / 534mm
In/Outfeed Height	Frame	17.75" / 450mm		
With adjustable leg extensions [foot pad]	Minimum Maximum	18" / 457mm 26.5" / 673mm		
Speed		Up to 10 cases / min.		
Shipping Weight	Approx.	600lbs. / 273kg.		

*Minimum case width of 8.3" [210mm] requires wrench changeover between smallest and larger sizes.

OPERATION & SERVICE MANUAL

INSTALLATION OF THE BEL 505XL PACKING STATION

Uncrate the machine and remove any packing material from the interior or supports from underneath used to protect components during shipping.

Install the legs at each of the three positions on the machine frame with one nut and washer for each leg underneath the frame and another nut and washer on the inside.

LEVELING THE MACHINE

. The base of the frame should be made level to ensure personnel safety, provide optimum performance and avoid frame stress.

Please note that the BEL 505XL is intended to operate in a horizontal position only. Attempting to incline the unit toward the operator will cause the case width adjustment mechanism to bind and could damage the width adjustment screw. [If an inclined packing station is required, the BEL 507XL Tilt Packing Station is designed to tilt down towards the operator for case loading and then back to the horizontal position for feeding into a sealer or onto a conveyor.]

The machine should be securely mounted to adjoining equipment to prevent the machine moving as it operates.

AIR CONNECTION

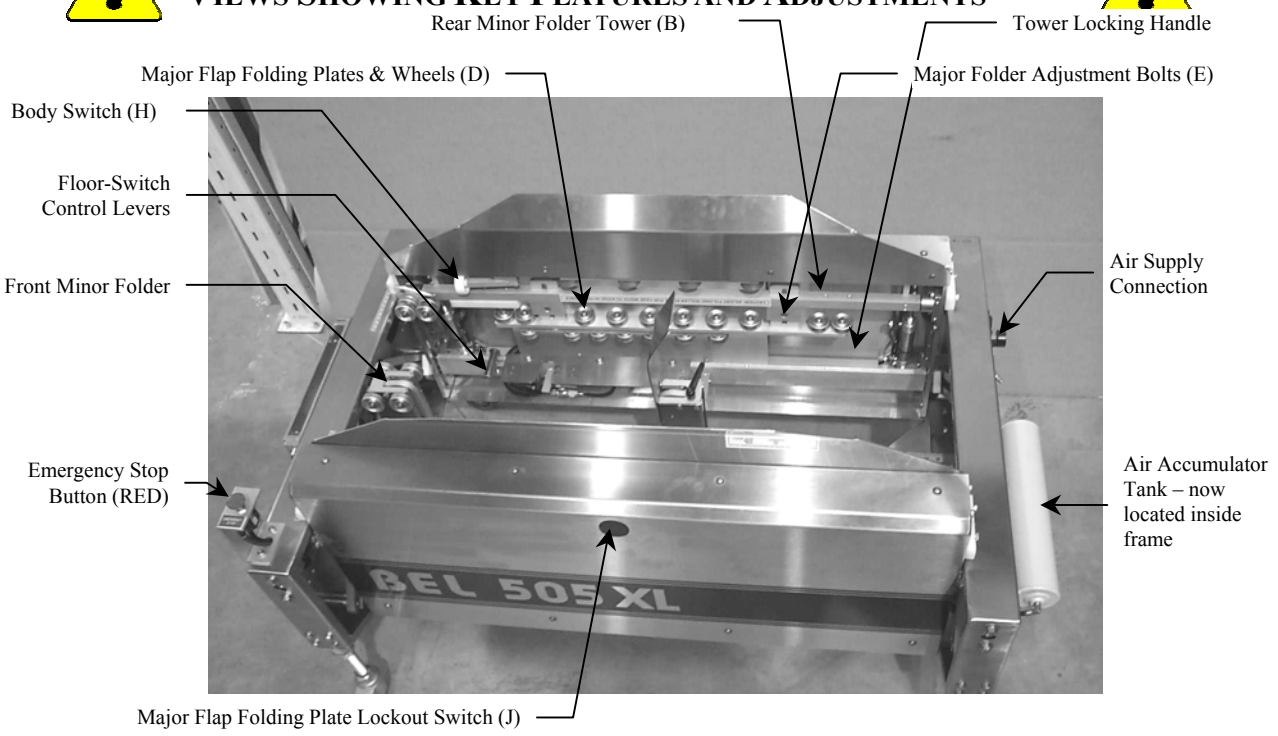
SAFETY CAUTION

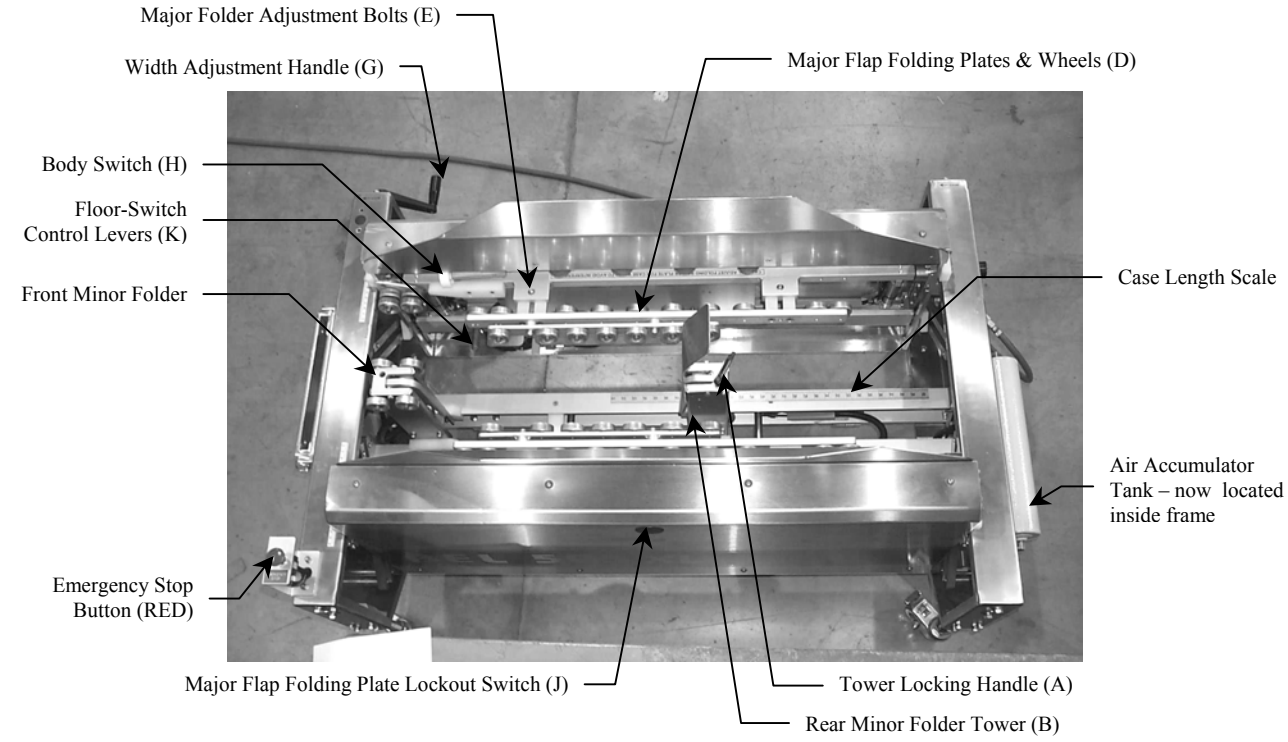
Make sure that the red emergency stop button is pushed down (off) before connecting an air supply to the machine.

The air may come from either a separate source or by tapping off the supply of an adjoining case closer. The supply must be clean factory air and must be lubricated by the unit on the machine.

Air pressure should be set to 80 psi. for most applications with a minimum setting of 65 psi. and maximum of 100 psi.

VIEWS SHOWING KEY FEATURES AND ADJUSTMENTS


Rear Minor Folder Tower (B)
Tower Locking Handle
Major Flap Folding Plates & Wheels (D)
Major Folder Adjustment Bolts (E)
Body Switch (H)
Floor-Switch Control Levers
Front Minor Folder
Air Supply Connection
Emergency Stop Button (RED)
Air Accumulator Tank – now located inside frame
BEL 505 XL
Major Flap Folding Plate Lockout Switch (J)


Major Folder Adjustment Bolts (E)
Width Adjustment Handle (G)
Major Flap Folding Plates & Wheels (D)
Body Switch (H)
Floor-Switch Control Levers (K)
Front Minor Folder
Case Length Scale
Air Accumulator Tank – now located inside frame
Emergency Stop Button (RED)
Major Flap Folding Plate Lockout Switch (J)
Tower Locking Handle (A)
Rear Minor Folder Tower (B)

SAFETY CAUTION

Disconnect Air Supply Prior to Adjustment.

Disconnect air line or close main air supply valve and press red stop button down to fully disconnect unit from air supply line and prevent unexpected movement when unit is re-connected. (Check that moving parts are in safe mode by moving by hand; they should be relaxed and able to be moved easily).

Note: If the BEL 505XL is attached to a case sealer, it is a recommended safety precaution to turn off the sealer before making any adjustments.

LENGTH ADJUSTMENT

1. Loosen 'T' handle (A) on the tower base for the case rear minor flap folder.

2. Slide the tower (B) to measured box length on scale (C).

3. Re-tighten the handle (A).

WIDTH ADJUSTMENT

1. Adjust width by turning crank (G) until box slides without excessive friction between stainless steel sides.

2. Check that the 'Body Switch' (H) that contacts the side of the box is depressed adequately.

   NOTE: Insufficient pressure on this switch can cause the machine to prematurely release the folding mechanism or double cycle.

3. Major flap folding plates and wheels (D) may need adjustment to provide additional support for wide heavy cases. There are two major folder plates on each side of the machine, one small and one large, that are adjusted independently.

   3.1. The larger plates are adjusted by loosening the Allen bolts at positions (E), and sliding either outwards or inwards to a position to best support lower major flaps.

   NOTE: Sliding the plates in towards the machine center increases bottom support, but limits the minimum width adjustment to the point where the major flap folder wheels are about to contact the tower (B).

   3.2. The smaller major flap plates are adjusted separately by loosening hex head bolts from underneath the plates. They are less likely to require adjustment, but again note that sliding the plates to the innermost position may limit the minimum case size or they may hit the "floor switch" control levers or their mounting plates.

4. Check by hand prior to turning power on, that wheels do not hit tower (B), strike "floor switch" control levers (K) or their mounting brackets when the machine is adjusted to the correct case size.

   NOTE: For very wide cases, alternate bottom roller wheels are often mounted on extensions from the folding plates to place them closer to the center of the box for better folding performance and product support. Extensions may need to be removed for narrow cases run on the same machine to avoid interference with other machine components. If your

application requires these extensions and they are not provided with your machine, contact BELCOR for information and parts.

LOWER FLAP DEPTH ADJUSTMENT

The lower "floor switch" control lever positions are adjusted automatically as the width is adjusted.

STARTING THE MACHINE

SAFETY CAUTION

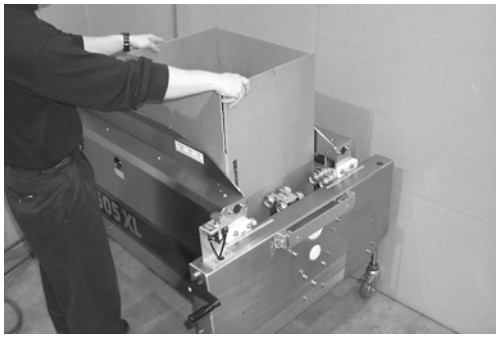
Make sure that the red emergency stop button is pushed down before connecting an air supply to the machine.

Prior to starting, hand swing all moving parts to check adjustment and for any mechanical interference. Turn on main supply valve, keeping hands clear of moving parts.

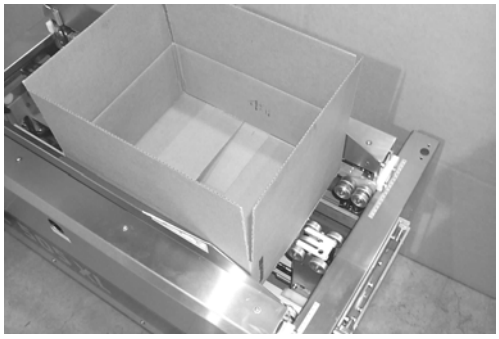
MACHINE OPERATION

1. Open a flat case so that it is square.

2. Place the open bottom into the BEL 505XL, pushing the box all the way down to actuate the "floor switch" control levers.



3. The machine will first fold the front and rear end minor flaps, then the two side major flaps. The case is held in place by the machine and is ready to fill.



4. Alternatively, the major flap folding plates can be locked in position using the lockout switch (J). This permits the station to be used solely as a packing station without using the folding capabilities of the unit.

MANUAL RESET

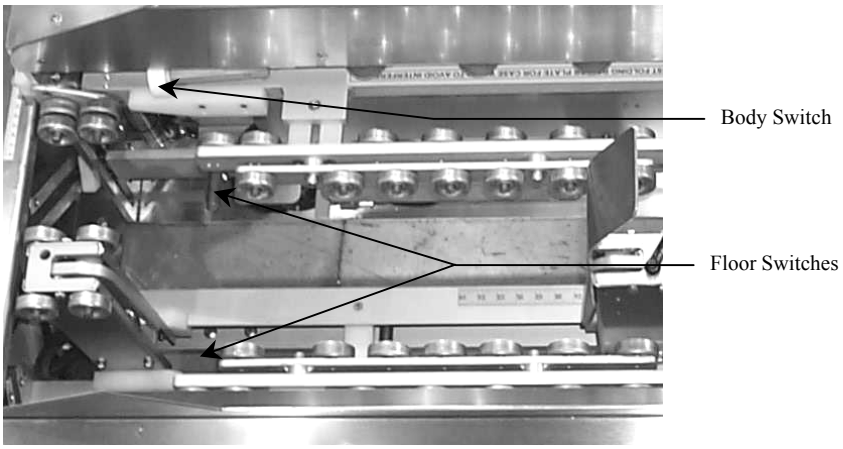
NOTE: The lockup switch also has a reset function that may need to be used after a case jam that causes the machine cycle to shift out of sequence. Switch the machine to Lockup mode and then back to force a manual reset of the cycle.

5. When the case is filled, the case can then be pushed out of the packing station to the next operation.

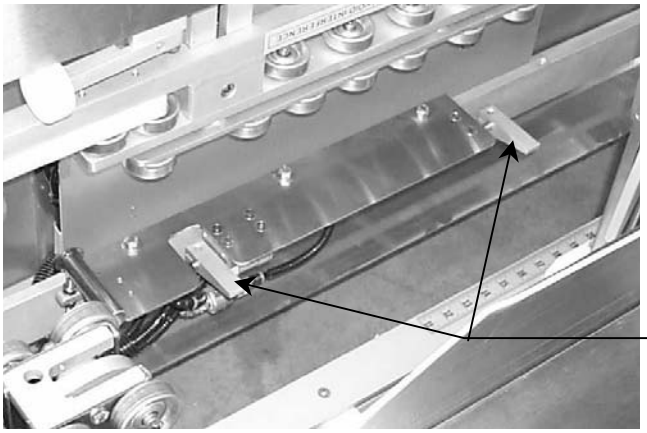
MACHINE CYCLE

The machine operating cycle is as follows:

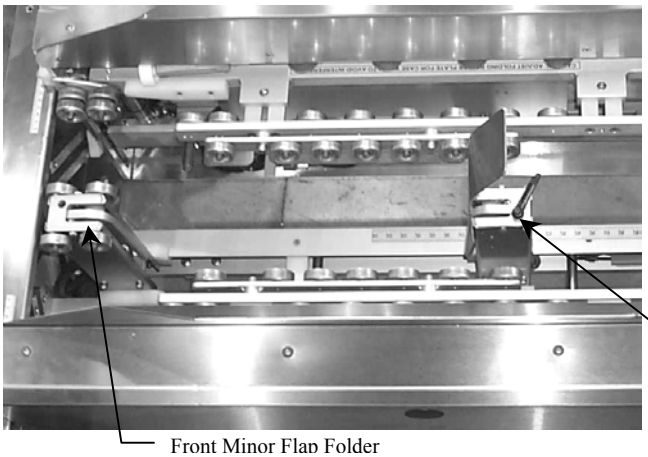
1. The edges of the open case bottom major flaps depress the actuators of the two “floor switches” and the side of the case depresses the wheeled “body switch”. All three switches must be actuated for the machine cycle to start.



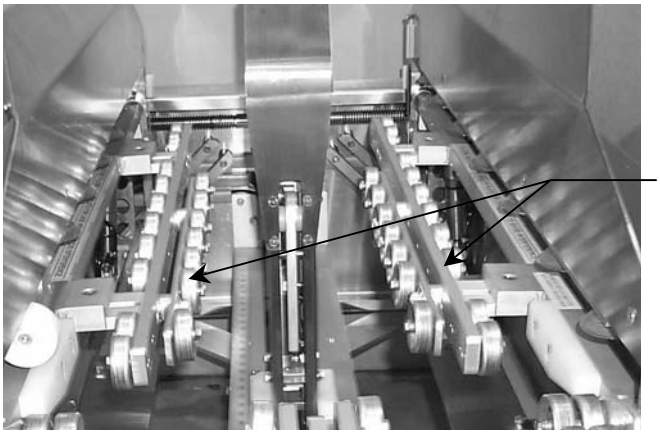
2. The two small levers of the major (side) flap openers momentarily open the major flaps wider to clear the minor (end) flaps.



3. The minor flap folders fold up both end flaps of the box bottom and retract.



4. The major flap folders then fold up both side flaps of the bottom and stay in position to support the box for packing.



TROUBLESHOOTING GUIDE

Problem: *Case releases, all flaps drop, during folding or packing cycle.*

- Check that width adjustment is correct, if this too wide the wheeled "body switch" that contacts the side of the case will reset and cause the machine to return to the start position. Shaking the box to level the contents can cause the body switch to reset.

- Check that the body switch is correctly adjusted and secured in the frame for proper box contact and that the contact wheel is firmly attached.

Problem: *Minor flaps fail to fold fully and return to home position, and then may try to fold again.*

- Check that actuator arms attached to the lower floor switch control levers (mounted on brackets on both sides of the machine) are not out of position or loose. Both of them should be in a position to be pushed down fully by the bottom flaps of the open box.

Problem: *Major flaps have difficulty folding and cause inner edges of minor flaps to be folded over.*

- Check that the air pressure is adequate and that the air pressure does not drop during the cycle.

- Check that the flow controls on the small major flap opening cylinders are set so that they will momentarily open the major flaps wider and allow the minor flaps to clear the inside of the major flaps before releasing.

Problem: *Back or front case collapses inward during minor flap folding.*

- Be sure that the case width setting does not hold the box too tightly.

- Check the air pressure and volume.

- Check that the scoring on the box is adequate and promotes folding.

- Check that the flow controls on the minor flap folding cylinders are set for a fast enough speed of the minor flap folders. Excessive speed, however, can cause damage of the folder arms.

Problem: *Packed case fails to transfer smoothly from packing station into case sealer.*

- Check the height of the rollers at the outfeed end of the packing station and that the box clears the machine frame.

- Check that the machines are aligned accurately, i.e. that the belt surfaces line up with the insides of the packing station when in the vertical position.

  NOTE: This can be done by using a long straight edge to check the alignment between the machines.

TECHNICAL REFERENCE INFORMATION: Please see Publication 66-13-1